A Joint Newsletter of the New Hampshire Coastal Program and New Hampshire Estuaries Project

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Pickering Brook Aerial

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Office of State Planning

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Manager's Musings

By Dave Hartman, New Hampshire Coastal Program Manager

Great News on the Funding Front

With the passage of the Federal Omnibus Appropriations Bill in February came news of significant funding for several coastal initiatives.

Habitat Restoration Initiative. The successes that the Coastal Program has had in habitat restoration efforts in recent years helped in securing a $1 million grant for continuing our Habitat Restoration Initiative. Thanks go to Senator Judd Gregg for that appropriation. This money will enable us to continue with salt marsh restoration projects in Rye and to begin restoration work on several tidal streams in the coastal watershed.

Groundwater Sustainability Initiative. Great news was the announcement of a special $500 thousand grant to initiate work on the Groundwater Sustainability Initiative. Thanks are extended to Senators John Sununu and Judd Gregg for this appropriation. Working with communities throughout the coastal watershed, the Coastal Program has helped coordinate the large effort to develop baseline data regarding the availability and sustainability of groundwater for coastal communities. The project is designed for a three-year timeframe, closely coordinating with the Federal and State Geological Surveys to assess the long-term groundwater needs and availability.

The Gulf of Maine Council will be receiving an award of $250 thousand for the continuing work throughout the Gulf of Maine. Again, Senator Gregg is to be thanked for making that happen. In his previous office, Governor Gregg had been one of the original signors of the documents creating the Council over 13 years ago, and his steadfast support in subsequent years has been appreciated by both the Canadian and U.S. Council members.

Annual Coastal Program NOAA Award. This year we will be receiving $1.4 million to implement our basic Coastal Program. Included in that award and due to our success in gaining full approval of our Coastal Non-point Pollution Control Program, New Hampshire is eligible for a special implementation grant for watershed-wide activities. These activities are in the development stages at the moment. With this award, we will be able to continue our assistance to the Department of Environmental Services for coastal wetlands enforcement, erosion control, on-site septic disposal system approval and sewage treatment plant inspection. Also, we will be able to fund the majority of competitive grant applications that were submitted to us for funding this past January. The effective start date for this grant is July 1, 2003.

Repair of the Seabrook's River Street Cut. Persistence has paid off in having the U.S. Army Corps of Engineers place the Seabrook River Street Cut repair project on their "to do" list. The Dredge Management Task Force has had this project as its highest priority focus

for over two years at this point. When the project is completed, the need for annual dredging (at a cost of several hundred thousands of dollars a year to the State) will be eliminated. The Corps has proposed an innovative solution to this aggravating problem, which includes long-term monitoring of the success of their work which could be used to justify similar solutions elsewhere in the Country.

Malynda Nichol to Develop HMAP Program

The New Hampshire Coastal Program is fortunate in having Intern Malynda Nichol join us while she works toward her Master's degree in Environmental Education at the University of New Hampshire. At UNH she is a History of Marine Animal Population Research Student under the guidance of Dr. Andy Rosenberg. She anticipates graduation in the spring of 2003.

Malynda's primary task is developing curriculum that is based on the History of Marine Animal Populations (HMAP) Program. The curriculum will focus on the theme "Science and History Unite." She will develop a three-day long program for grades 5-9 that deals with the information related to HMAP in a "past, present, and future" format. Educators at the Seacoast Science Center and the Aquaculture Education Research Center expressed interest in the program. The Coastal Program would like to link the curriculum to its website so that teachers can access the program. Malynda's will be with the Coastal Program through June 2003.

Restoration of Pickering Brook Salt Marsh

By Grace E. Bottitta, Biologist, Ducks Unlimited

Pickering Brook, Greenland, NH

In the early 1900s, the majority of coastal saltmarshes in New England were ditched as part of an aggressive mosquito control program. In an attempt to eradicate mosquito-breeding habitat, the ditches drained the open water necessary for a healthy saltmarsh. What resulted was the loss of open water on the marsh surface, critical for black ducks, wading birds, shorebirds, and fish, including those that eat mosquito larvae. The absence of mosquito-eating fish on the salt marsh surface allows high numbers of mosquitoes to breed and hatch, which necessitates spraying throughout the summer to control mosquito populations.

Throughout last summer Ducks Unlimited, the University of New Hampshire, SWAMP Inc. the NH Coastal Program and local volunteers, documented the degraded condition of the marsh; including fish and bird usage, mosquito larvae abundance, and groundwater levels.

In December 2002, the first phase of restoration began. The frozen marsh surface made it easier for the specialized wetland equipment to fill in sections of the ditches and create deep pools and shallow pannes. Phase 2 of the restoration will be completed by Winter 2003-2004. By increasing the amount of water available on the marsh surface, we will re-create essential open water habitat that will allow native salt marsh dependant species - waterfowl, fish, and shorebirds to return and increase in number. This restoration will also naturally manage the mosquito population and improve water quality. Monitoring will continue until Fall 2004.

Ducks Unlimited in partnership with the Town of Greenland, the New Hampshire Coastal Program, University of New Hampshire, Great Bay National Estuarine Research Reserve, U. S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration and the Portsmouth Country Club - will restore the Pickering Brook Saltmarsh to its former natural beauty and function.

The specialized low ground pressure excavator and dump carrier used to implement this restoration work exerts about two-pounds/square inch of pressure on the surface of the marsh (less than a human footprint).

To find out more about this project or other Ducks Unlimited projects throughout New England or would like to volunteer on this or, for any questions please contact Grace Bottitta at (603) 778-0704 or e-mail gbottitta@ducks.org.

What Lies Beneath

By Mary Power, New Hampshire Coastal Program

The next time you find yourself paddling into Great Bay on a hot summer day or perhaps motoring toward the Isles of Shoals on a crisp, clear New Year's Eve, consider this: there may be hundreds of pounds of mangled metal, rotting rope, boat parts and shopping carts resting just under the water's surface. It is human nature to ignore things that are unpleasant or that are out of sight but the staff at the New Hampshire Coastal Program never stops thinking about these issues. We are constantly researching ways to remove this trash and to educate people in order to change behavior.

New Hampshire has participated in the annual International Coastal Clean-up for the past 16 years. For the past five years we have been joined by a group of enthusiastic Scuba divers who have roamed the muddy bottom removing the bottles, cans and used oil filters that have been discarded over time. The club has cleaned the underwater sites from Seabrook to the Isles of Shoals and plans are underway for a cleanup under Rye Harbor during the 2003 cleanup in September.

The United Divers of New Hampshire dive club was established 26 years ago and there are approximately 45 members, half of which live in the seacoast region. The other half live in the Manchester area and members range in age from 19 to 65. Many are open ocean divers but there are some who prefer ice diving and some who enjoy visiting underwater caves. All are at various stages of certification and all are very interesting folks.

"I have always enjoyed the water, both above and below," says Steve Cantelli, President of the United Divers of New Hampshire. "The more I dive, the more I realize the amount of work we still need to do in order to educate the public. I started diving in 1969 and the trash never decreases. During some cleanups it seems like it is getting worse, not better. Jacques Cousteau made us aware in the

Thinking Warm Thoughts: Reflections on the Gulf of Maine Institute, Summer 2002

By Lorie Chase, Coordinator of Cocheco River Watershed Coalition

Gulf of Maine Institute (GOMI) believes that the long- term preservation of the Gulf and its watershed requires an educated, aware, and highly engaged citizenry. GOMI brings together students, educators and their community partners from Massachusetts, New Hampshire, Maine, New Brunswick and Nova Scotia every summer for a Summer Institute. With funding from the New Hampshire Coastal Program and partnership with Stafford County UNH Cooperative Extension and Strafford County Commissioners, last year's gathering was held in New Hampshire. From their base at the UNH Campus in Durham, students and adults spread out around the Great Bay Estuary and coastal watersheds and worked together to build team skills and make connections with the natural and human ecology of the Gulf of Maine watershed.

To prepare for the summer institute, students work on projects in their local

1950's and here we are 50 years later with minimal progress. What do we need to do to get our point across?"

The divers club was successful in recruiting two scout troops to join us for the underwater cleanup of Gosport Harbor at the Isles of Shoals during the 2002 Coastal Cleanup. The boy scouts from Raymond, New Hampshire and the girl scouts from Lyndebrough, New Hampshire had to get out of bed very early in order to make it to the dock in time, but they all seemed fascinated and eager to help with the task. The scouts played a very important role in the mission.

Once we arrived at Gosport, Coastal Program staff and the scout troops got aboard the Shoals Marine Lab vessel, Kingsbury, which acted as the receiving barge for the waterlogged trash. The divers pulled their finds up to the surface and piled them onto canoes. We asked the scouts to assist by hauling the trash-filled net bags from the divers' canoes up to the deck of the *Kingsbury*. Five-gallon plastic buckets with drill holes were attached to the boat and some of the heavier or odd-shaped trash was placed in them for the scouts to bring aboard. They separated the debris, removed, inspected and returned any live animals to the sea and then recorded everything they found. The total weight of debris was about 900 pounds. The experience has inspired the scout troop and the leaders to plan other adventures relating to resource protection. The scouts will pursue their interest in learning more about canoes.

In past years the United Divers of New Hampshire have done underwater cleanups at the Prescott Park docks for two sequential years, Portsmouth's Fisherman's coop, Gosport Harbor at Isles of Shoals and Seabrook-Hampton Harbor. Each year the participation from the club is enthusiastic and the numbers increase with each request from the Coastal Program.

Visit the United Divers of New Hampshire's website at www.udnh.org

If you would like to participate in the Annual Coastal Cleanup please call Mary Power at 431-9366 or Verna DeLauer at 271-2155.

communities during the school year. They conduct a variety of monitoring and restoration projects. This year one of the student teams canoed the Lamprey River to explore the riparian land uses and related impacts on water quality and in-stream habitat. The beauty of the Lamprey in the heart of Newmarket was a pleasant surprise, but students found several impacts of land use that made them think about the need for change. They created outreach materials to share what they had learned.
Another student team visited several salt marsh and rocky coastline sites on Great Bay and the Coast to study invasive species. They also created outreach materials.

The participants who had attended the prior two summer institutes in Nova Scotia and Maine worked together to learn a planning process for identifying and addressing community issues. After learning mapping and navigation skills, they rowed a full scale replica whaleboat to an island in Great Bay, just ahead of a squall.

The Cocheco River Watershed Coalition is the New Hampshire sponsor of the Gulf of Maine Institute. New Hampshire students came from Dover, Somersworth, Durham, Rochester, Barrington and Farmington schools. Strafford County UNH Cooperative Extension and the Strafford County Commissioners were partners and Waste management, Inc. generously contributed t-shirts and supplies. Summer Institute 2003 will take place in New Brunswick, Canada.

News From the Coastal Nonpoint Pollution Control Program

Study Evaluates Stream Conditions

By Sally Soule, Non-Point Pollution Coordinator

The coastal watershed is currently experiencing significant population growth and development. Activities associated with growth such as watershed urbanization, stream channelization, and shoreline development change the physical and biological functions of the watershed's rivers and streams. These changes can upset a river or stream's natural flow regime and adversely affect plants and animals.

Hydromodification is a term used to describe the alteration of hydrologic systems in rivers and streams. A hydromodification assessment provides information that can be used to develop restoration and protection plans for rivers and streams. New Hampshire's Coastal Nonpoint Pollution Control Program (CNPCP) recently implemented a new project to track hydromodification in the coastal watershed.

NHCP Restoration Specialist Jen Droziack records an area of erosion during a GBCW hydromodification survey.

GBCW Volunteers Laura Fant (l) and Eileen Williams (r) prepare to head into the field for a survey.

In spring 2002 the Great Bay Coast Watch (GBCW) received a grant from the CNPCP to conduct a hydromodification assessment in the coastal watershed. The "Instream and Riparian Habitat Assessment" identifies hydromodification in tidal and freshwater tributaries. To conduct the assessment, GBCW volunteers walk miles of shoreline to document erosion, bank armoring, or other activities that could alter the hydrologic function of the stream or river. Data gathered during the assessment are used to plan and implement restoration projects. Local agencies and conservation groups work with CNPCP and GBCW to identify sites that need assessment.

Volunteers typically spend two to four hours evaluating a stream or river segment. Sometimes the terrain is rugged and walking the shoreline is physically challenging. Despite these challenges the volunteers involved in the project appreciate the opportunity to focus on an aspect of rivers and streams that is not often studied. "The study gives volunteers new opportunities and appreciation of the shorelines in their communities. They are enthusiastic about handling sophisticated equipment and keeping detailed records of the shore's condition and instream habitats." According to Ann Reid, GBCW's Coordinator,

Before going out to survey volunteers participate in training workshops that cover safety, data collection, and proper equipment operation. Once in the field the volunteers evaluate the river bottom, shoreline, and riparian corridors. Areas impacted by hydromodification are photographed and mapped. Often, the volunteers observe bird life such as great blue herons, snowy egrets, and many kinds of ducks. Such sightings are an added job perk and can provide helpful information about wildlife.

In 2002 Volunteers conducted surveys on five Great Bay tributaries. Work will resume in spring 2003 when volunteers will finish the tidal segments and move on to assess freshwater tributaries. Findings from the study will be published in a report. For more information about the assessment project, please call Ann Reid, GBCW, at (603) 749-1564 or Sally Soule, NHCP, (603) 431-9366.

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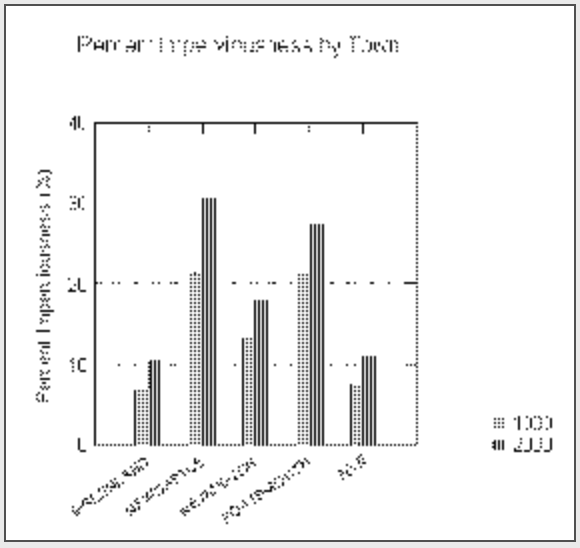
Jennifer Hunter, Director

Areas Covered by Impervious Surfaces Are Increasing in New Hampshire's Coastal Towns

By Dave Kellam, Project Assistant, New Hampshire Estuaries Project

A 2002 report by the Complex Systems Research Center at the University of New Hampshire (UNH) reported that the area covered by impervious surfaces in New Hampshire's coastal watershed towns has increased by 2%, or 22.2 square miles, from 1990 to 2000. This NHEP-funded study represents the first time a quantified estimate of change in impervious surface area has been produced in the region and it provides valuable insight into the rate of development in NH's coastal watershed. Impervious surfaces are defined in the study as "surfaces through which water cannot penetrate . . . including roadways, parking lots, rooftops, paved driveways, and any other paved surfaces." Since rainwater cannot infiltrate these surfaces it must be directed into sewers, rivers, or the sea, usually through a storm water system. Runoff from impervious surfaces often carries elevated levels of pollutants, such as heavy metals, salt, oil, and excess nutrients, directly into waters that are utilized by wildlife and people. Therefore, an increase in the area covered by impervious surfaces is a warning that water quality in the watershed can be getting worse.



Imperviousness of Portsmouth and surrounding towns for 1990 and 2000.

To quantify the area covered by impervious surfaces, UNH researchers David Justice and Fay Rubin used a computer to analyze satellite images of 48 towns in coastal New Hampshire. By processing the images to map areas representing hard building materials (like concrete or asphalt), they developed a reliable estimate of impervious surface area. The analysis revealed that 4.3% of the coastal watershed region was covered by impervious surfaces in 1990 and 6.3% of the area was covered in 2000.

Because of the rapid changes occurring to the land in the coastal area the researchers recommend that this study be repeated every three to five years. To help inform other research being done in the region they translated the study's data into GIS format so that it could be overlaid onto existing resource maps. This type of data is especially valuable to planners wishing to develop land in ways that minimize the impact on the area's natural resources.

To download a .pdf version of this report go the NHEP website at www.state.nh.us/nhep.

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Juvenile Clam Field Experiments in Hampton Harbor Provide Insight into a Roller Coaster Population

Experimental unit protected from predators by plastic mesh.

By Dave Kellam, Project Assistant, New Hampshire Estuaries Project

Hampton Harbor is located about 45 miles northeast of Boston and is known as New Hampshire's best bet for harvesting soft-shell clams; at least during some years. In the past 30 years the Hampton Harbor flats have experienced dramatic peaks and valleys in its clam populations ranging from a high of 27,000 bushels in 1997 to lows less than 1,000 bushels in 1978 and 1987. Overharvesting was suspected as the cause of these fishery

Research team deploying experimental units on clam flats in Hampton Harbor.

crashes; however, recent examinations suggest that there may be more to the story.

In 2001 the New Hampshire Estuaries Project issued a Request for Proposals (RFP) to "determine the cause(s) of juvenile soft-shell clam mortality in the Hampton/Seabrook Estuary." The focus of the RFP was on juvenile clam mortality because previous surveys suggested that clam larvae were settling in the harbor's substrate but juvenile clams were not being recruited to the adult class. Researchers, clammers, and managers had compiled a list of possible causes for the juvenile clam mortality that included disease, human disturbance, winterkill, pollution, competition with other bivalves, and/or predation from wildlife. These factors were written into the RFP to ensure that they were addressed by the research.

University of Maine at Machias researcher Dr. Brian Beal was awarded a grant to conduct field research at three clam flats in Hampton Harbor from November 2001 to July 2002. To understand what was happening to juvenile clams, Dr. Beal employed a series of manipulative field experiments. He placed hatchery-reared, juvenile clams into six-inch plastic plant pots that were filled with sediments from each flat and buried them to their rims. Half the pots were stocked with a high density of clams to determine whether crowding affected survival. To assess the effects of predation Dr. Beal placed flexible plastic netting over some of the pots to exclude predators. He collared other pots with netting that extended about 1 inch above the rim to contain clams dislodged by sediment erosion. In total, Dr. Beal's research team placed 360 pots in the harbor from November through March and another 360 pots for the period from March to mid-July. The carefully crafted design also addressed potential differences in clam growth and survival with respect to tidal height. In addition to these field experiments wild and experimental clams were tested for Hematopoietic neoplasia, a common clam disease.

The results of Dr. Beal's work suggested that sediment erosion by tidal and wind currents and predation by crustaceans, primarily green crabs, were significant factors that increased juvenile clam mortality. Strong currents dislodged many of the experimental units and the unprotected clams simply were washed away. Predation by the non-native green crab (Carcinus maenas L.), a notorious juvenile clam predator, was observed in unprotected pots and pots with torn protective screening.

Dr. Beal's study is not the final step in understanding Hampton Harbor's clam stocks. More work needs to be done to quantify the effects of recreational clam harvesting, clam stocking, competition with other bivalves and other factors that will become apparent as work progresses. What Dr. Beal's study does represent is the first experimental study in Hampton Harbor that tests specific hypotheses about local clam populations to offer resource managers quantitative data that may inform management decisions.

Photos courtesy of Dr. Brian Beal

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Upcoming Workshops and Events

Achieving Smart Growth in New Hampshire: A Workshop
Monday May 12, 7:00pm to 9:00pm, New England Center, Durham
Sponsored by the Rockingham and Strafford Regional Planning Commissions

3rd Annual Exeter River Alewife Festival
Saturday May 31, 10:00am to 2:00pm, Swazey Park in Exeter
Celebrate the Exeter River's rich history and natural resources. Witness the annual migration of alewives and other anadromous fish as they swim from the sea to their freshwater spawning sites. Festival attendees can enjoy art, music, food and fun educational activities. Sponsored by the Exeter River Local Advisory Committee

2003 National Estuaries Day, September 27th,
This national day kicks-off NH's Estuaries Month activities.

New Hampshire Estuaries Month, September 27th through October 28th
Many NHEP-funded outreach programs will occur throughout the coastal watershed.

NH Estuaries Expo, October 18th, 10:00am to 3:00pm, Urban Forestry Center, Portsmouth
A public event highlighting the health of New Hampshire's estuaries. The day will include slideshows, educational displays and presentations that illustrate the current condition of the State's estuarine resources.

State of the Estuaries Conference, October 20th and 21st. Yoken's Conference Center, Portsmouth
A technical conference examining key environmental health indicators of New Hampshire's estuarine systems. This conference is a joint effort between the NHEP and the Great Bay National Estuarine Research Reserve.

WELCOMING NHEP'S NEW EMPLOYEE!

Dave Kellam, NHEP Project Assistant

Dave comes to the NHEP from the Audubon Society of New Hampshire where he was the Executive Director of the Amoskeag Fishways in Manchester and the Massabesic Audubon Center in Auburn. In the past year he was an adjunct instructor at the University of New Hampshire where he designed and taught an environmental communication course in the Communication Department. He hails from Indiana where he received his Bachelor's and Masters of Science degrees from Purdue University.

2003 NHEP Local Grants Program Recipients

The New Hampshire Estuaries Project is pleased to announce its 2003 local grant recipients who were awarded funding for projects that address natural resource issues throughout the coastal watershed. Grants were awarded on a competitive basis to municipalities, community groups, educational institutions, and regional organizations. Each project helps achieve part of the NHEP's Management Plan goals. Recipients of funding for 2003 are:

Moose Mountain Regional Greenways (MMRG)
MMRG will continue to provide technical expertise and expand outreach to local conservation commissions related to the documentation and acquisition of prime wetlands. Amount Awarded: $10,000

Exeter River Local Advisory Committee (ERLAC)
ERLAC will advertise for the 3rd Annual Exeter River Alewife Festival by producing posters, printing

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palm cards and purchasing ads in area newspapers. Amount Awarded: $5,250

Seacoast Land Trust (SLT) SLT will conduct a GIS natural resource mapping project in Greenland and present the results during land conservation workshops to municipal boards and landowners. SLT received NHEP funds in 2001 for a similar project that included Sagamore Creek and Berry's Brook. Amount Awarded: $3,625

Aquaculture Education & Research Center (AERC) AERC will conduct a "Dockside Shellfish Aquaculture Project" that will involve coastal landowners in a volunteer juvenile shellfish collection program. AERC will recruit and train volunteers to grow shellfish using mesh bags hung from their docks. The young shellfish will then be used to reseed local shellfish beds. Amount Awarded: $10,000

Rockingham County Conservation District (RCCD) RCCD will conduct a project to promote land protection within the Hampton Harbor watershed using GIS mapping to prioritize resources for protection. RCCD will also implement education and outreach activities on conservation opportunities and estate planning. Amount Awarded: $9,868

Portsmouth Middle School (PMS) PMS will work collaboratively with UNH resource professionals to conduct an education project that involves sixth grade students in the ongoing South Mill Pond habitat restoration project. Students will characterize bird activity and spatial distribution from May to June. Lesson plans related to ecology, phytoplankton, birds, and scientific methods will be developed as part of the project. Amount Awarded: $5,725

Great Bay Coast Watch (GBCW) GBCW will revise and update the GBCW Standard Operating Procedures Volunteers Monitoring Manual to comply with EPA's revised quality assurance procedures. This also includes development of training workshops for volunteers on new sampling protocols. Amount Awarded: $5,000

GRANT OPPORTUNITY ESTUARIES MONTH 2003: Outreach Grants

The NHEP will again be offering $200 grants to organizations conducting outreach activities in the coastal watershed that promote awareness and protection of New Hampshire's estuarine environments. All eligible projects must be sponsored by an organization and occur between September 27th and October 28th, 2003 (NH Estuaries Month). A Request For Proposals will be issued in May, 2003. For more information contact Dave Kellam, NHEP Project Assistant, at 433-7187 or Dave.Kellam@rscs.net.

Examples of previously funded Outreach Grant projects include:

Sandy Point Discovery Center, Poster Contest

Great Bay Coast Watch, Great Bay Coast Watch Day of Caring

The Great Bay Stewards, Estuaries Day at Sandy Point Discovery Center

Stratham Conservation Commission, Water Conservation Workshop

UNH Sea Grant Extension and Great Bay National Estuarine Research Reserve, Great Bay Cruise for Coastal Decision-makers

Odiorne Homestead at Odiorne State Park, Staddle Repair Workshop

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Marine Mammal Protection Act-30 Years of Success Threatened

By Jan Pendlebury, New Hampshire Chapter, National Environmental Trust and New Hampshire Global Warming

The Marine Mammal Protection Act (MMPA) recently marked 30 years of success. "Once destroyed, biological capital cannot be recreated," stated Congressman John Dingell (D-MI), September 9, 1971 when opening the floor debate on developing a comprehensive law to protect marine mammals. Joined by Senator Ernest F. Hollings (D-SC) and signed into law by then President Richard M. Nixon in 1972, the MMPA has over the years helped to establish critical habitat protections for dolphins, whales and sea otters, among other marine mammals. This Act has become the benchmark for other environmental protection laws that have helped to improve our air quality, clean our water and protect endangered species.

Before the MMPA was enacted, more than a million whales died as a result of commercial whaling, hundreds of thousands of seals died in annual seal hunts and 400,000 dolphins were killed annually in tuna fishing. Since the Act passed in 1972, Grey whales have returned from the brink of extinction - from a few thousand to an estimated 23,000; California sea otters, Florida manatees, Hawaiian monk seals and dolphins have all seen their populations stabilize and some have begun to recover; the number of dolphins caught in tuna nets has dropped by as much as 99 percent; and California sea otters rebounded from a small colony to roughly 2,000.

Yet despite the demonstrable effectiveness of the MMPA, new threats to the law do exist, and some old threats promise to return. Discussions about commercial whaling, supported by Japan, have entered into international negotiations. Ship strikes, as a result of increased shipping activity, continue to injure and kill whales in New England and manatees in Florida. Each year, large numbers of marine mammals are killed as a result of commercial fishing - entanglement in active and inactive fishing gear killed 115 marine mammals in 2000. Pollution from oil spills, sewage run-off and power plant discharge as well as non-point source pollution like agricultural run-off is an increasing threat to the health of several marine mammal populations. A wide range of coastal and offshore activities like shipping, oil and gas exploration and drilling increases the ambient ocean noise, but its effects on marine mammals has been difficult to quantify.

Much of the success of the MMPA stems on the definition of harassment, which regulates the level of disturbance that humans can cause marine mammals. Although former United States Senator Smith (R-NH) was not involved in drafting the initial language of this Act, he was instrumental in upholding threats to the strong protective language that surfaced last summer, with attempts to redefine harassment.

The military's use of sonar testing, using a middle frequency at times up to 230 decibels, has been easy to quantify. Sonar testing has been implicated in a series of whale strandings and deaths; the cause is believed to be the loud decibel of the sonar bursting the whale's eardrums, causing disorientation, beaching and ultimately death. Despite the press this issue received in 2002, the military was allocated 1 million square miles of ocean for testing.

Low Frequency Active Sonar [LFA], used to detect quiet submarines at a distance, produces sound that is designed to travel great distances. Sound generated from LFA sonar in San Francisco has the equivalent land sound to be heard as far away as Nashville, Tennessee, affecting all organisms in between. The hearing sense of whales and dolphins is highly developed, employing sound to search for food, escape danger, care for their young, communicate with mates and to keep their pod together as they migrate.

Current threats to the MMPA are attempts to exempt the military from

permitting requirements under the MMPA, which would allow them to participate in a wide range of activities without regard to their impact on marine mammals. The Department Of Defense and the current administration are also attempting to change the definition of the term harassment. If either attempt to change the definition of harassment is successful, protections for marine mammals will be greatly reduced.

In New England this change could lead to an increase in off-shore oil and gas development with fewer safeguards to protect marine mammals. This would also have a negative impact on New England's fishing industry. Increase deaths of marine mammals as a result of military activities or increase development and offshore oil and gas exploration will also have a very negative impact on the whale watching industry in New England, an industry that generates tens of millions of dollars in New England.

As we celebrate one of this nation's greatest conservation acts, we must remain vigilant in keeping it strong as threats loom to weaken it.

NH Coastal Program Seeks Volunteers for Saltmarsh Monitoring

By Jen Drociak, Coastal Restoration Specialist

Do you live near a saltmarsh? Do you know the landscape or is it one you've always wanted to explore? Are you a plant enthusiast, or do you fish? Would you just like a change or pace or scenery for a day or two? If you answered "yes" to any of these questions, volunteer opportunities for saltmarsh monitoring abound!

What Is A Saltmarsh & Why Should We Protect Them?

Saltmarshes serve as the transition from the ocean to the land; where fresh and salt water mix. Saltmarsh plants are salt tolerant and adapted to water levels that fluctuate with the tide. Tides carry in nutrients that stimulate plant growth in the marsh and carry out organic material that feeds fish and other organisms. Over time, saltmarshes accumulate organic material into a dense layer called peat. Saltmarshes are among the most productive ecosystems on earth.

There are about 6,200 acres of saltmarsh in New Hampshire, many of which have been damaged by restricted tidal flow, filling, ditching, and increased freshwater flows. Restoration is necessary because saltmarshes are important because

they act as nursery areas for fish, crustacea and other insects; protect inlands from wave action and sea

level rise; aid in mosquito control; and also aid in invasive vegetation control.

What's The Workload Look Like?

This spring and summer, state resource managers and ecologists will be instructing volunteers in the use of a variety of biological, ecological, and chemical indicators to assess the health of local saltmarshes. Volunteers with this program will employ the same techniques as professionals and are directly involved in current wetland research.

The following parameters will be monitored at each site throughout the summer: You can be involved with one parameter, or all five. Time commitment is negotiable and will be based on the volunteer's interest and schedule.

Water Quality/Chemistry: Volunteers will test root-zone level salinity at well stations in each wetland using hand-held syringes and refractometers. In pools and pannes that are characterized, volunteers will also test water temperature, dissolved oxygen (mg/l and percent saturation), and salinity levels.

Vegetation: Volunteers will track the species and percent cover of vegetation in a series of half-meter square plots along several transects at each site.

Fish: Volunteers will assist will placing "pull nets" Pull nets in creeks and pannes at each site. They will then assist with sorting, counting, and identifying the fish.

What Saltmarshes Will Be Monitored?

During the summer of 2003, the following marshes will be monitored: Bass Beach/(Rye); Little River (N. Hampton; Pickering Creek Salt Marsh (Greenland); Vol's Island Saltmarsh (Durham).

Will Volunteers Be Trained?

Of course! Two separate half-day weekend workshops will be conducted for training volunteers in each one of the five parameters. These workshops will include both a classroom and field component. Following the workshop, volunteers will split into groups to monitor one or more of the salt marshes over the field season. A volunteer coordinator (employee with Ducks Unlimited or NHCP) will oversee, organize, and provide logistical and technical support as trained volunteers collect data at the study sites. The coordinator and instructors provide quality control assurances throughout field work and data management efforts - including the collecting and inspection of field sheets, entry into spreadsheet software, analysis, and production of report, graphs, and charts.

At the closing of the first field season, a wrap-up volunteer event will be held after the completion of data collection. At the meeting, a preliminary synopsis of the season's findings will be presented to the volunteers via the professionals. These findings will then be used to support state and regional programs to evaluate wetland restoration potential, actions, and success.

How Do I Sign Up?

To volunteer some time this summer, or for any questions please contact Jen Drociak at (603) 271-1774 or e-mail jdrociak@osp.state.nh.us. Training sessions will be announced in Early April, 2003. We look forward to working with you!

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Dockside Shellfish Aquaculture Project

By Dyanna Smith, Director of Aquaculture Education and Research Center

With the help of the New Hampshire Coastal Program (NHCP) and the Greater Piscataqua Community Foundation (GPCF), the Aquaculture Education and Research Center (AERC) is laying the groundwork for a new project soliciting coastal landowner's volunteer participation in shellfish aquaculture and coastal conservation. The Dockside Shellfish Aquaculture Project allows AERC to collaborate with coastal property owners by recruiting and training volunteer "keepers" to collect juvenile shellfish from the waters around their docks. The collected shellfish will then be used to reseed known local shellfish beds.

AERC has six pilot research sites that are currently testing the methodology of using spat collectors close to the shoreline, either attached to a dock or pier, or floating next to one. Our goal is to launch the dockside shellfish aquaculture project in the community, with the target of 20 locations collecting spat from summer 2003 until spring 2004.

We are focusing on collecting the spat (seed) of two types of molluscan shellfish found locally in the wild: sea scallops (Placopecten magellanicus), and American and European oysters (Crassostrea virginica, Ostrea edulis). Because sea scallops are presently a commercially harvested species, providing for additional spat collection will aid in recruitment and restoration of the fishery. Stock replacement currently relies solely on replenishment by natural settlement and recruitment. The New Hampshire Estuaries Project Management Plan identifies "limited availability of suitable larvae attachment substrate" as a likely factor in shellfish population decline. This program would augment natural population replenishment through artificial (aquacultural) means by providing alternative "substrate" for settlement in the form of mesh bags.

Releasing the collected juvenile shellfish may also help in restoring depleted populations on grounds that formerly held scallop and oyster beds. Wild oysters are presently a recreationally harvested species but are known to play an important role (as most bivalve molluscs do) as "living filters" - improving water clarity and quality. Therefore, you can never really have too many oysters working in any bay impacted by human activity. The need to restore and enhance existing oyster bars in Great Bay and Little Bay is great.

Why collect spat under docks? Every year oysters and scallops spawn into local waters, and the resulting seed needs places to settle and grow to maturity. In the wild, shellfish such as the sea scallop release eggs and sperm into the water column in early fall for fertilization. Reproduction is often triggered by other shellfish spawning in the area. Fewer scallops on a bed means less chance for egg fertilization, and this may be one of the situations contributing to scallop population decline. When fertilization does occur, the larvae, or spat, that result float throughout the water column for approximately 40 days. They then find a hard surface on which to settle. Our spat collectors should provide such a place.

There is current spat collection research being done in the Gulf of Maine, but the sites are primarily in deeper ocean water. Collecting seed oysters and scallops at or near existing docks has the advantage of easy accessibility. By contrast, placing spat collectors at sites that can only be accessed by boat and tended by divers intensifies labor effort and expense. Our program

relies heavily on volunteer "keepers" to provide care and maintenance of the collectors, report any findings, and be "first responders" in an exigency. Such intensive care should have advantages over leaving collectors to the mercies of the current, tide, and foul weather, possibly for days and weeks.

The project is based out of Hampton, where AERC is located. Sites are targeted for Great Bay, the Piscataqua River, Hampton-Seabrook harbor, Rye harbor, and other tidal waterways where larval shellfish are anticipated. We have pilot sites at Wentworth Marina, Barker's wharf on the Piscataqua, the New Castle coast guard pier, Gosport Harbor on Star Island, Rye Harbor Marina, and Great Bay Marine (this site is supervised by classes of 5th and 6th graders attending Newington Elementary School).

We want to make the dockside project very visible, to bring the public into greater contact with the project and raise general awareness of needs to conserve marine resources, such as shellfish. For example, the Little Harbor area has had difficulty with enforcing the rules for bilge pumping at the end of the season. Excess nutrients degrade the habitat. The Wentworth Marina is serving as a pilot site in hopes that signage from the project will help educate boaters and encourage them to refrain from prohibited dumping in the open water.

AERC has designed its approach based on the input of other researchers and uses a successful model for under-dock oyster collecting in Chesapeake Bay that involves community volunteers. The Chesapeake Bay program, called "Oyster Gardeners" is a highly successful campaign to reseed Bay oyster beds and educate the public on the issues of water quality in the Bay. Our project applies a similar method and philosophy to Great Bay and the coastal New Hampshire waters.

AERC is recruiting keepers. During the spring and early summer, new keepers will have the option to attend one of two workshops which will describe the project in detail. The workshops will also provide materials and training for building, then deploying, their spat collectors. AERC's website will be expanded to include up to date information on the timing for keepers to deploy at their sites. The web site will also provide shellfish information, a resource for keepers with current events related to the project, and a special page for keepers to post observations or maintenance details and share information.

During the winter and early spring, keepers will periodically pull up their collectors to remove predators, such as starfish and green crabs. (Collectors are designed specifically to suspend in the water column in a way that prevents predators from access to the spat as much as possible.) In the spring, keepers again have the option of attending either of two workshops, and will bring in their spat bags to harvest whatever they catch. The spat will be distributed to local fishermen (most likely lobster boats) who will spread them over identified oyster and scallop beds for reseeding.

This is a project that AERC hopes will grow into a yearly program in the coastal community. Our long term expectations for the project are to increasingly recruit shoreline property owners as participants, expand the reach of our educational messages, and, over time, be able to see an increase in juvenile shellfish found in our dockside collectors as New Hampshire shellfish populations grow. Of course, our ultimate goal is to increase the population of local shellfish so recreational shellfish enthusiasts have improved opportunities to collect scallops and oysters in our area.

AERC

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